STREAM CLASSIFICATION STUDY ON THE YAHARA RIVER TRIBUTARY AT MORRISONVILLE, DANE COUNTY

Department of Natural Resources - Madison Area
February, 1985
Prepared by David Marshall

General Information

Drainage Basin: 012 - Lower Rock
Drainage Area: 18.7 square miles
Estimated $Q_{7,10}$ 0.9 mi. N.W. of Morrisonville: 0.0 CFS
Classification upstream of CTH "DM": Marg-E
Classification downstream of CTH "DM": FAL-C

The Yahara River Tributary arises in Columbia County and flows southeast into Dane County at Morrisonville. The stream is intermittent in that reach and drains croplands mixed with wetlands. Channeled flow becomes diffuse in some of the wetland areas. In the reach downstream of Morrisonville, the tributary flows east and then south to the confluence with the Yahara River. Flow is continuous and the stream channel is well defined in that reach. Intensive agriculture and non-point source pollution have a major impact on the stream. Habitat for aquatic life is limited because stream substrates are silt laden.

Fishery and Macroinvertebrate Data

Prior to the classification survey, there was no recorded fishery information on the tributary. On December 15, 1984, the stream was shocked in the vicinity of the N. Yahara Rd. bridge. Species identified were: Green sunfish (Lepomis cyanellus), Brook sticklebacks (Culaea inconstans), fathead minnows (Pimephales promelas), creek chubs (Semotilus atromaculatus), and stoneroller sp. (Compostoma). A short distance below the confluence with the Yahara River, WDNR Fish Research made a collection in 1975. At that time, all of the species were forage fish with white suckers (Catostomus commersoni) the most abundant. Large numbers of suckers were probably making spawning runs at that time.

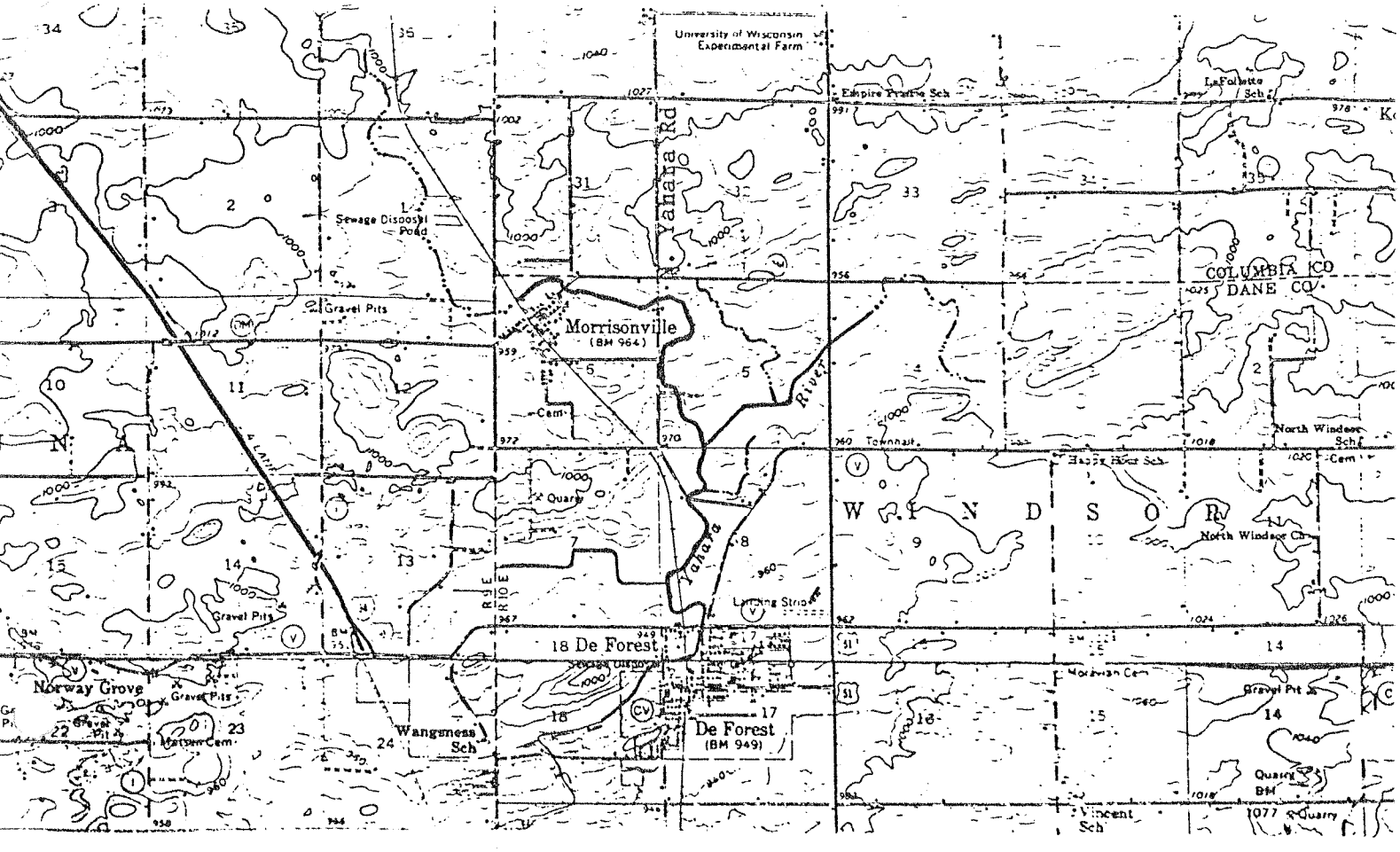
The Biotic Index of a macroinvertebrate sample collected at N. Yahara Rd. on December 10, 1984 is 3.25. This value indicates fair water quality.

Habitat Evaluation

Two investigators separately evaluated the stream habitat from CTH "DM" downstream to N. Yahara Road. The reach scores were 222 and 223 indicating poor habitat conditions. These scores reflect non-point source problems in the watershed.

Classification

The Yahara tributary above Morrisonville will not support permanent fishery or macroinvertebrate populations because of extreme low flow conditions and the diffuse nature of the stream. Below Morrisonville, the tributary supports tolerant and intolerant forage fish and macroinvertebrate species which indicate fair water quality. The classification above CTH "DM" in Morrisonville is marginal surface waters (Marg-E). Below that point, the classification is full fish and aquatic life (FAL-C).



Macroinvertebrate Data
North Yahara Road
December 10, 1984

	n	a	nxa
Coenagrionidae (young nymphs)	5	-	
Cheumatopsyche	10	3	30
Hydropsyche betteni	9	3	27
Dubiraphia larva	2	3	6
Stenelmis larva	1	3	3
Procladius	1	3	3
Rheotanytarsus	3	3	9
Thienemannimyia complex	28	3	84
Empididae	2	3	6
Simulium vittatum	29	4	116
Hexatoma	3	3	9
Tipula	2	2	4
Gamarus pseudolimneaus	20	2	40
Hyalella azteca	10	4	40
Asellus intermedius	8	5	40
Total	128		417

Biotic Index = 3.26 - Fair Water Quality

Fishery Data
WDNR Fish Research
Yahara River, T9N-R10E, N.W., Sec. 8
May 5, 1975

Bluntnose minnow Pimephales notatus	9
*Central stoneroller Compostoma anomalum	1
*Creek chub Semotilus atromaculatus	18
*Fathead minnow Pimephales promelas	4
White Sucker Catostoma commersoni	99
*Brook stickleback Culaea inconstans	25
Mottled sculpin Cottus bairdi	1

*Species also identified in the Yahara River Tributary on December 10, 1984.

Department of Natural Resources

STREAM SYSTEM HABITAT RATING FORM
Form 3200-63 1-8

Stream Yahara R. Trib. Reach Location Morrisonville downstream to mouth Reach Score/Rating 223

County Dane Date 12-10-84 Evaluator Marshall Classification FAL-C

Rating Item	Category			
	Excellect	Good	Fair	Poor
Watershed Erosion	No evidence of significant erosion. Stable forest or grass land. Little potential for future erosion. 8	Some erosion evident. No significant "raw" areas. Good land mgmt. practices in area. Low potential for significant erosion. 10	Moderate erosion evident. Erosion from heavy storm events obvious. Some "raw" areas. Potential for significant erosion. 14	Heavy erosion evider Probable erosion from a run off. (15)
Watershed Nonpoint Source	No evidence of significant source. Little potential for future problem. 8	Some potential sources (roads, urban area, farm fields). 10	Moderate sources (small wetlands, tile fields, urban area, intense agriculture) (14)	Obvious sources (maj wetland drainage, high u urban or industrial are feed lots, impoundment)
Bank Erosion, Failure	No evidence of significant erosion or bank failure. Little potential for future problem. 4	Infrequent, small areas, mostly healed over. Some potential in extreme floods. 8	Moderate frequency and size. Some "raw" spots. Erosion potential during high flow. (18) 16	Many eroded areas. "Raw areas frequent alon straight sections an bends.
Bank Vegetative Protection	90% plant density. Diverse trees, shrubs, grass. Plants healthy with apparently good root system. 6	70-90% density. Fewer plant species. A few barren or thin areas. Vegetation appears generally healthy. 9	50-70% density. Dominated by grass, sparse trees and shrubs. Plant types and conditions suggest poorer soil binding (15)	<50% density. Many ra areas. Thin grass, few any trees and shrubs.
Lower Bank Channel Capacity	Ample for present peak flow plus some increase. Peak flow contained. W/D ratio <7. 8	Adequate. Overbank flows rare. W/D ratio 8-15. 10	Barely contains present peaks. Occasional overbank flow. W/D ratio 15-25. (13) 14	Inadequate, overbank flo common. W/D ratio >25.
Lower Bank Deposition	Little or no enlargement of channel or point bars. 6	Some new increase in bar formation, mostly from coarse gravel. 9	Moderate deposition of new gravel and coarse sand on old and some new bars. 15	Heavy deposits of fine m terial, increased bar deve opment. (16)
Bottom Scouring and Deposition	Less than 5% of the bottom affected by scouring and deposition. 4	5-30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. 8	30-50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. 16 (18)	More than 50% of the b tom changing nearly y long. Pools almost abs due to deposition.
Bottom Substrate/ Available Cover	Greater than 50% rubble, gravel or other stable habitat. 2	30-50% rubble, gravel or other stable habitat. Adequate habitat. 7	10-30% rubble, gravel or other stable habitat. Habitat availability less than desirable. 17	Less than 10% rub gravel or other stab habitat. Lack of habitat obvious. (20)
Avg. Depth Riffles and Runs	Cold >1' 0 Warm >1.5' 0	6" to 1' 6 10" to 1.5' 6	3" to 6" 18 6" to 10" 18	<3" <6" (20)
Avg. Depth of Pools	Cold >4' 0 Warm >5' 0	3' to 4' 6 4' to 5' 6	2' to 3' 18 3' to 4' 18	<2' <3' (20)
Flow, at Rep. Low Flow	Cold >2 cfs 0 Warm >5 cfs 0	1-2 cfs 6 2-5 cfs 6	.5-1 cfs 18 1-2 cfs 18	<.5 cfs <1 cfs
Pool/Riffle, Run/Bend Ratio (distance between riffles ÷ stream width)	5-7. Variety of habitat. Deep riffles and pools. 4	7-15. Adequate depth in pools and riffles. Bends provide habitat. 8	15-25. Occasional riffle or bend. Bottom contours provide some habitat. (16)	>25. Essentially a straigh stream. Generally all fla water or shallow riffle Poor habitat.
Aesthetics	Wilderness characteristics, outstanding natural beauty. Usually wooded or unpastured corridor. 8	High natural beauty. Trees, historic site. Some development may be visible. 10	Common setting, not offensive. Developed but uncluttered area. (14)	Stream does not inhance aesthetics. Condition o stream is offensive.
Column Totals:	____	____	139	84

Column Scores E ____ +G ____ +F 139 +P 84 = 223 = Score

<70 = Excellent, 71-129 = Good, 130-200 = Fair, >200 = Poor

Department of Natural Resources

STREAM SYSTEM HABITAT RATING FORM

Form 3200-68 1-85

Stream Yahara R. trib. Reach Location Morrisonville downstream to mouth Reach Score/Rating 222

County Dane Date 12-10-84 Evaluator Sesing Classification FAL-C

Rating Item	Category			
	Excellect	Good	Fair	Poor
Watershed Erosion	No evidence of significant erosion. Stable forest or grass land. Little potential for future erosion. 8	Some erosion evident. No significant "raw" areas. Good land mgmt. practices in area. Low potential for significant erosion. 10	Moderate erosion evident. Erosion from heavy storm events obvious. Some "raw" areas. Potential for significant erosion. 14	Heavy erosion evident Probable erosion from any run off. (12) 1
Watershed Nonpoint Source	No evidence of significant source. Little potential for future problem. 8	Some potential sources (roads, urban area, farm fields). 10	Moderate sources (small wetlands, tile fields, urban area, intense agriculture) (14)	Obvious sources (majo wetland drainage, high us urban or industrial area feed lots, impoundment). 1
Bank Erosion, Failure	No evidence of significant erosion or bank failure. Little potential for future problem. 4	Infrequent, small areas, mostly healed over. Some potential in extreme floods. 8	Moderate frequency and size. Some "raw" spots. Erosion potential during high flow. 16	Many eroded areas. "Raw" areas frequent alon straight sections an bends. (18) 2
Bank Vegetative Protection	90% plant density. Diverse trees, shrubs, grass. Plants healthy with apparently good root system. 6	70-90% density. Fewer plant species. A few barren or thin areas. Vegetation appears generally healthy. 9	50-70% density. Dominated by grass, sparse trees and shrubs. Plant types and conditions suggest poorer soil binding (15)	<50% density. Many ra areas. Thin grass, few i any trees and shrubs. 1
Lower Bank Channel Capacity	Ample for present peak flow plus some increase. Peak flow contained. W/D ratio <7. 8	Adequate. Overbank flows rare. W/D ratio 8-15. 10	Barely contains present peaks. Occasional overbank flow. W/D ratio 15-25. 14	Inadequate, overbank flo common. W/D ratio >25. (15) 1
Lower Bank Deposition	Little or no enlargement of channel or point bars. 6	Some new increase in bar formation, mostly from coarse gravel. 9	Moderate deposition of new gravel and coarse sand on old and some new bars. 15	Heavy deposits of fin terial, increased bar devel opment. (1
Bottom Scouring and Deposition	Less than 5% of the bottom affected by scouring and deposition. 4	5-30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. 8	30-50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. (16)	More than 50% of the bot tom changing nearly yea long. Pools almost absen due to deposition. 2
Bottom Substrate/ Available Cover	Greater than 50% rubble, gravel or other stable habitat. 2	30-50% rubble, gravel or other stable habitat. Adequate habitat. 7	10-30% rubble, gravel or other stable habitat. Habitat availability less than desirable. 17	Less than 10% rubbl gravel or other stabl habitat. Lack of habitat i obvious. (20) 2
Avg. Depth Riffles and Runs	Cold >1' 0 Warm >1.5' 0	6" to 1' 6 10" to 1.5' 6	3" to 6" 18 6" to 10" 18	<3" 2 <6" (20) 2
Avg. Depth of Pools	Cold >4' 0 Warm >5' 0	3' to 4' 6 4' to 5' 6	2' to 3' 18 3' to 4' 18	<2' 2 <3' (20) 2
Flow, at Rep. Low Flow	Cold >2 cfs 0 Warm >5 cfs 0	1-2 cfs 6 2-5 cfs 6	.5-1 cfs 18 1-2 cfs 18	<.5 cfs 2 <1 cfs (2
Pool/Riffle, Run/Bend Ratio (distance between riffles ÷ stream width)	5-7. Variety of habitat. Deep riffles and pools. 4	7-15. Adequate depth in pools and riffles. Bends provide habitat. 8	15-25. Occasional riffle or bend. Bottom contours provide some habitat. (16)	>25. Essentially a straigh stream. Generally all fla water or shallow riffle Poor habitat. 2
Aesthetics	Wilderness characteristics, outstanding natural beauty. Usually wooded or unpastured corridor. 8	High natural beauty. Trees, historic site. Some development may be visible. 10	Common setting, not offensive. Developed but uncluttered area. (14)	Stream does not inhanc aesthetics. Condition o stream is offensive. 1
Column Totals:	____	____	200	10

Column Scores E ____ +G ____ +F 200 +P 102 = 222 = Score

CORRESPONDENCE/MEMORANDUM

NOV 13 1984 STATE OF WISCONSIN

Date: November 12, 1984 *File Ref:* 3200

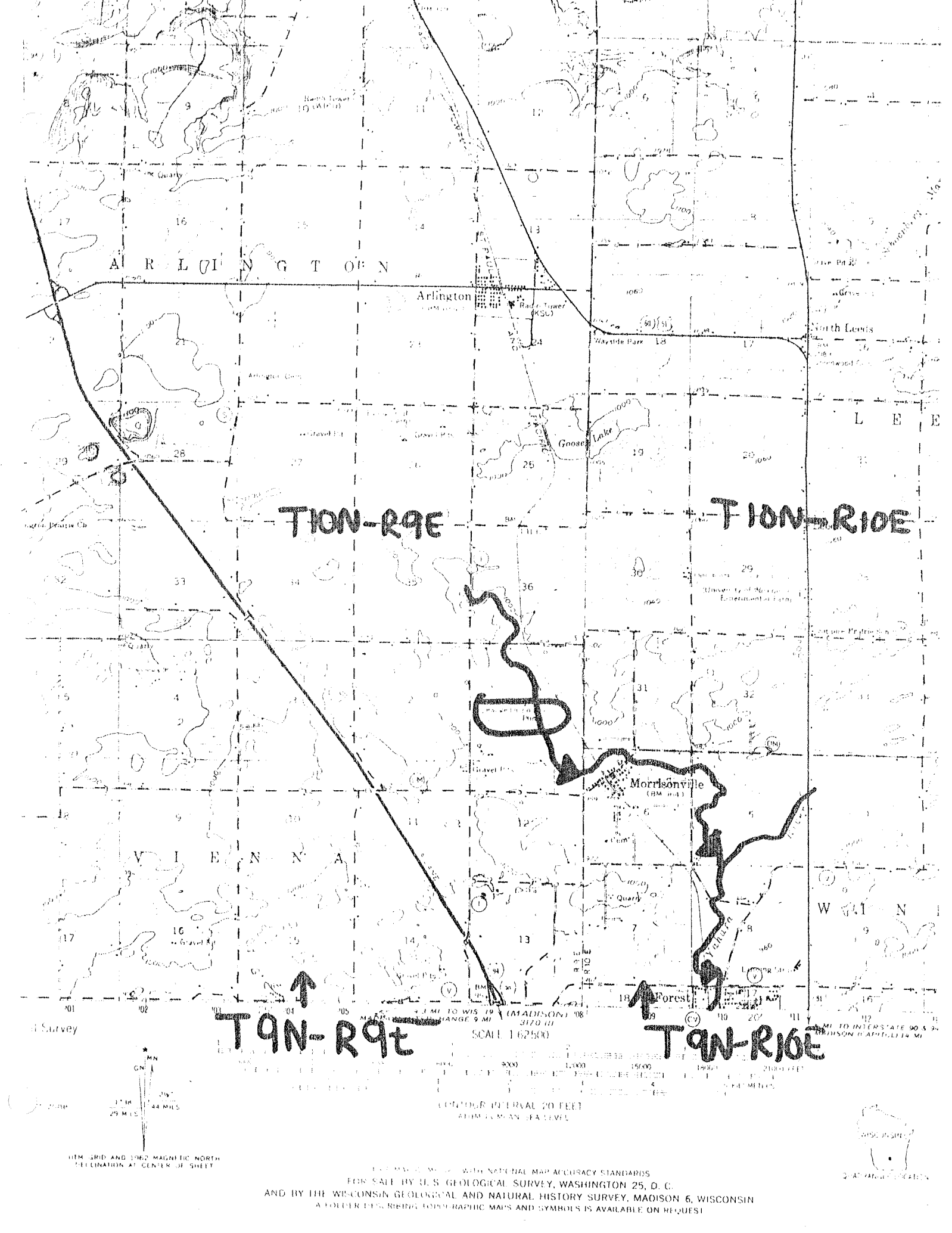
To: Douglas Morrissette, Southern District

From: Lyman Wible - ADM/5

Subject: Stream Classification Request for Morrisonville

The Morrisonville Sanitary District has requested effluent limitations for a proposed discharge to an unnamed tributary of the Yahara River in Dane County. Even though the Department may not grant permission for a discharge from this facility based on the restriction in s. 144.05, Stats., an evaluation of the stream should be made. Therefore, in order to answer this request, a stream classification is requested for the tributary below the discharge point located in Section 1, T9N-R9E (Town of Vienna), Dane County. A map of the stream is attached.

LW:jsm
Attachment
cc: Jim Schmidt - WRM/2


T10N-R9E
T10N-R10E
T9N-R9E
T9N-R10E
Arlington
Morrisonville
Forest
Goose Lake
North Leeds
SCALE 1:62500
CONTOUR INTERVAL 20 FEET

APPROVED:

J. Schmidt: _____ 11/7

D. Schuettpelz: _____ 11/8

B. Baker: _____ 11/8

L. Wible: _____ _____

Return to WRM/2 for mailing.